|  |
| --- |
| THIS DOCUMENT HAS BEEN PREPARED FOR THE PURPOSES OF THE  **PROJECT RESOURCE CENTER**.   IT IS FOR GENERAL GUIDANCE PURPOSES ONLY AND SHOULD NOT BE USED AS A SUBSTITUTE  FOR SPECIFIC TECHNICAL, PROCUREMENT OR LEGAL ADVICE FOR A PROJECT |

# TERMS OF REFERENCE

# Technical Expansion and Cost Recovery Options for Electricity Transmission Expansion for Renewable Energy

## BACKGROUND

*<Brief overview describing the power sector in the country: power sector reform, power sector planning, transmission regulation and renewable energy program.>*

## OBJECTIVE

To illustrate the impacts of alternative expansion principles for the connection of RE under the principles set in the [renewable law], using scenarios of developing areas with RE resources, and inform the discussion on the policy, technical, and regulatory aspects that need be defined for the effective implementation of the RE law and succeed in achieving objectives of scaling-up new small renewables potential.

In particular, to study the impacts on transmission expansion costs and on RE generation development of two planning principles, namely reactive or proactive planning. Reactive planning considers that expansions are planned on a first come first serve basis and the costs are allocated with existing transmission regulations (i.e., transmission expansion for RE is no different from conventional power generation). Proactive planning considers that transmission expansion is optimized in a coordinated fashion for RE –potential– projects in a given zone and that different cost-allocation to existing regulations are permitted as envisioned by the new [RE law] (i.e., similar to what is known as RE zones or corridor).

## Task and Deliverables

In order to accomplish the above objective the consultant should perform, among others, the following tasks:

Task 1: Based on available information of [country] potential RE sources in each region, the [donor] will develop and inform the consultant RE scenarios to be used for the transmission cost analysis on this TORs. Scenarios will be based mostly on RE potential estimations and, more importantly, according to “service request contracts” for study and development of RE awarded by [department of energy] in the context of the new [RE law]. The service contracts contain potential locations of the projects and indicative size.

Task 2: The scenario will be constrained to a particular geographical area. Alternative expansions plans to reach the generators will be built by the consultant. The existing network close to the geographical of potential RE projects in the selected scenario will be modeled using a simplified transmission networks base on available data.

Task 3: Use optimization-based computer models to determine two alternative expansion plans to connect the selected RE resources in the scenario. One reactive plan and one proactive plan.

The reactive plan considers expansions based on a first come first serve basis, and reactive plans considers a coordinated planning for entire RE zones. The plans will be performed for the area with information on transmission to be provided by the [donor] in coordination with the [national transmission agency]. The area of interest will consist of a territorial area where investors have expressed their interest to build RE power plant. The concession process to develop RE sites in [country] start with a “service contract request” to the [department of energy]. These service contract requests give the exclusive right to carry out feasibility of the related the RE generation projects and, should the feasibility study confirm the interest of the investor, priority for the development of the RE resource. (These service contracts do not correspond to or guarantee a supply contract to sell the RE.)

Task 4: Determine the capital costs of both expansion plans a long with a basic engineering description of the networks (distances, voltage levels, and substation capacities).

Task 5: Indicative feed-in tariffs will be provided by the [donor] for two RE generation (one hydro, one wind). Typical capital cost and load factor will be assumed for the RE power plants, to be proposed by consultant in agreement with the [donor]. Plant sizes to be consider will be based on the sizes specified in the “service contracts” (expression of interest) by interested partied to build RE power plants.

Task 6: The impact of different transmission-cost allocation mechanisms, for each of the two planning alternatives, on the base case return on investment will be determined for each power plant.

The cost allocation alternatives to be considered are: (i) existing regulation, (ii) a regulation that allocated cost only to RE producers; (iii) an allocation mechanisms that allocated cost to final consumers; and (iv) a mixed allocation procedure. A stylized numerical impact of the different allocation mechanisms on average transmission tariffs to the rest of transmission systems user will be determined for each scenario

## DELIVERABLES

Preliminary report I.

Report and associated power point presentation including background (this ToR), objectives, and results of tasks 1-3. Report and presentations will be reviewed by [donor] staff and personnel from [transmission company] in the [country].

Preliminary report II.

Report and power point presentation including results of tasks 2-6. The report and presentation will undergo revision by the [donor]. These report and power point presentation will support the [donor] a dialogue with [country]’s energy sector stakeholders on policy and regulatory options for transmission development for renewable energy.

Final report.

Preliminary report 2 and presentation modified to include final revisions as a result of the policy dialogue with [country]’s energy sector stakeholders undertaken by the [donor]. The final report should professionally drafted containing at least the following information: (i) intro and objectives; (ii) technical background information on transmission planning models used in the report; (iii) the description of the system being studied; (iv) results of alternative planning criteria; (v) the description of alternative cost-recovery schemes; (vi) all numerical results with analysis of results; (vii) conclusion; and (viii) list of references.